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Dundee Discussion Papers in Economics

The relationship between public education expenditure and economic growth: The case of India

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The relationship between public education expenditure and economic growth: The case of India

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Abstract: The paper reviews the theoretical and the empirical case for public investment in education in India. Though the theoretical literature provides a backing for such a policy, the empirical literature fails to find a robust relation between education expenditure and growth. Expenditure on education is a necessary but not a sufficient condition for growth. It seems that the effectiveness of education expenditure depends on the institutional and labour market characteristics of the economy. The effectiveness of education investments also depends on other factors such as trade openness. Due to these aforesaid factors, we argue that the empirical relation between education expenditure and growth for India has been inconsistent.

JEL Classification: E60, E62, H52, I25

Keywords: Public education expenditure, economic growth, trade openness, India

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1. Introduction

Education has always been regarded as one of the leading determinants of economic growth. The belief, that education promotes growth has led governments of many developing countries to invest in the education sector. Over time, many economic growth theories and models (such as Romer, 1990, Lucas, 1988 and Mankiw, Romel and Weil, 1992) have developed relating education and economic growth. The endogenous growth theories pioneered by Lucas (1988) and Romer (1990) regard human capital as a factor of production. One of the main features of the endogenous growth models (such as the Lucas model, 1988) is that education has an externality so that social rates of return are higher than the private rates of return. Hence, public subsidy to promote education has been justified by many scholars. However, the empirical investigations on the relationship between public education expenditure and growth have produced mixed findings.

Even in the case of India, the empirical findings are mixed. According to the economic growth theories, we expect a positive causal relationship to exist between them. But different empirical papers investigating for the relationship for India have come up with different results. For example, some papers find the association between public education expenditure and economic growth to be positive and some find it to be negative. Few empirical investigations even find that education expenditure has no impact on growth for India. Some scholars say that India's major success in the software industry in the last decade is largely due to the major investments made in the technical education in 1950s and 1960s (See Chandra, 2010). However, thus far, no robust empirical relation could be established between the two. Hence this assertion by Chandra must be seen as somewhat speculative.

This paper reviews some of the major empirical studies on the relationship between public education expenditure and economic growth for India and discusses the likely reasons behind the failure of the empirical literature to find a robust link between public education expenditure and growth.

The paper is structured as follows. The next section reviews the literature on the relationship between public education expenditure and economic growth for India. Sections three and four discuss the reasons behind the mixed findings of the empirical studies in general and that for India respectively. Section five reviews how the effectiveness of the public education expenditure can be improved through complementary policies relating to trade openness and other macro-economic aspects. Section six concludes.

2. Relationship between public education expenditure and growth: A review of the literature on India

The relationship between public education expenditure and economic growth is a frequently debated topic in both theoretical and empirical literature. Many empirical studies have tried to examine the relation between them for India and have come up with varied findings. Gounden (1967) shows that education expenditure are not very attractive forms of investment and its rate of return is very low compared to that of physical capital. Although the paper makes no attempt to measure the contribution of education expenditure towards economic growth yet it is important because it is one of the earliest studies that assess the education policies of the Indian government at a time when India had a “limited resource base”. The Indian government started spending a substantial portion of the budget on education immediately after independence and the total spending on education increased at a rate which was more than twice the growth rate of national income during 1950-1965.¹ Gounden (1967) finds that the marginal productivity of physical capital is higher compared to that of education and suggests diversion of resources in favour of physical capital. Ansari and Singh (1997) use annual time series data from 1951 to 1987 to study the relationship between public spending on education and growth and do not find any long run relationship between them. Bosworth, Collins and Virmani (2007) investigate the major contributors to India’s economic growth during the time period 1960-2004. The paper examines which sector-agriculture, industry, and the services-has contributed the

¹ See Gounden (1967) for a detailed discussion.

most in the growth process and what have been the driving factors such as increased employment, capital per worker and educational attainment. The authors conclude that education's contribution has been negligible. Pradhan (2009) investigates the causality between public education spending and economic growth in India during 1951 to 2001 using Error Correction Modelling. The findings suggest that there is uni-directional causality between education and economic growth in the Indian economy. The direction of causality is from economic growth to education spending and not vice versa.

Chandra (2010) tests for a causal relationship between education investments and economic growth for India for the time period 1951-2009 using linear and non-linear Granger causality methods. He finds that there is bi-directional causality between education spending and GDP for India. Tamang (2011) examines the relation using Error Correction Modelling technique for the years 1980-2008 and finds that there exists a long-run relationship between education expenditure and growth. Thus, it can be seen that, on a whole, the empirical evidence regarding this relationship is mixed and not clear-cut for India.

3. Reasons for inconsistency in the empirical relation between public education expenditure and growth

Blankenau, Simpson and Tomljanovich (2007) argue that many empirical studies, while examining this relationship, do not take the negative effects of taxation into consideration. The government can increase taxes in order to finance rising education expenditure. The negative tax effect offsets the positive education spending effect. In other words, taxation can alter the positive growth effects from increased public education expenditure. In fact some scholars hold the opinion that rising government expenditure can even slowdown the growth of an economy². Even if the government increases its borrowing instead of raising taxes, in order to finance its expenditure, then that may compete away the private sector, thus reducing private investment. Furthermore, if politicians increase expenditure

² See Nurudeen and Usman (2010) for details.

on unproductive projects (focusing on quantity rather than quality) in order to gain “cheap popularity” just before elections then such investments will only lead to misallocation of resources. As a result, growth will be hampered.

Another issue can be the problem associated with measuring the specific impact of education spending. Krueger and Lindahl (2000) say that a country which is improving its education policy is likely to change or improve other economic policies as well which will enhance its growth. That’s why it can be very difficult to separate the effect of education policy from that of the other policies.

Another reason behind the non-robust empirical relation between public education expenditure and economic growth can be attributed to the labour market characteristics and institutional structure of an economy.³ In other words, the institutional structure of an economy influences the choice of career made by the skilled workers and that, in turn, may have serious implications for the effectiveness of education expenditure on growth. For example, if property rights are not respected, innovations are not protected via patents and as a result, entrepreneurs cannot keep the profits out of the innovations done in their organizations, then entrepreneurship will be discouraged and skilled workers, in spite of having the expertise, will not engage in innovative activities. On the other hand, when the markets in a country are large and the people are encouraged to open their own businesses and are allowed to keep their profits, then many talented people get attracted towards entrepreneurship. The prime example of such behaviour is the Great Britain during the Industrial Revolution. However, most empirical works do not take the labour market or institutional factors into consideration. The utilization of human capital is in the labour market. The structure of the labour market is therefore vital for the determination of the productivity of human capital. The labour market in an economy also decides the type of use its human capital is put to. In other words, it determines that what proportion of the human capital is put into growth-enhancing activities and how much into non-productive activities such as pure rent seeking. The paper, Murphy et. al (1991) is quite useful to understand this

³ In the Lucas growth model (1988), people divide their time between work and further skill accumulation (research and training). One implication of this model is that the choice, which skilled workers in an economy make between growth enhancing activities or rent-seeking activities, depends on the dynamic features of that economy to a large extent.

concept. The paper says that markets demanding more civil servants and fewer engineers will not have the same outcome from investing in education as that of a market which encourages more engineering graduates. It shows that countries with more engineers grow faster whereas those with more lawyers grow comparatively at a slower rate. The paper ran regressions for all countries and found that there is a positive and significant effect of engineers on growth and a negative and insignificant effect of lawyers on growth.⁴

Given an option, people always choose the occupation which offers the highest return on their abilities. Thus, which profession the talented lot in any economy chooses, determines the allocation of resources. If they become rent-seekers then there is no wealth creation and the economy stagnates. Such situation is experienced in those countries where the rent-seekers such as government officials and the military have substantial authority. In other words, the institutional structure of a country also needs to be considered in this regard. There are not many empirical works in the literature on education expenditure and growth which pays special attention to the institutional structure of the country in question (Pissarides, 2000). Deeper country research is needed in this regard.

We discuss in the following section how institutional structure and labour market rigidities have probably lessened the impact of education spending on growth in India.

Furthermore, another reason behind the mixed empirical evidence on the relation between public education expenditure and growth is the difficulty in measuring the social returns of education investments (See Psacharopoulos and Patrinos, 2004). Some empirical papers have tried to capture that but the estimates vary widely. The social returns from education investments may also be regarded as spillover effects as they spill over from the skilled workers to other members of the society, as suggested by Lucas. Few papers have been able to identify some of those positive externalities but it is very hard to quantify them.

⁴ In regressions with countries with large student populations, the impact of engineers on growth doubled and became more significant.

4. Reasons for inconsistency in the empirical relation between public education expenditure and growth: The case of India

Gounden (1967) argues that education expenditure is not a very attractive form of investment. However, 1967 was too early to judge that from the perspective of the Indian economy. Generally speaking, such expenditure is long run investment and sometimes takes decades to give returns.⁵ For example, as mentioned earlier, there is a belief among many scholars that the software boom in India in the 2000s is partly due to the earlier public investments in Indian Institutes of Technology (IITs) in the 1950-60s (See Chandra, 2010).

Goel (1974) argues that most of the increase in the education expenditure in India has gone into quantitative expansion rather qualitative improvements. Although the education expenditure as a proportion of the national income rose from 1.3% in 1951-52 to 2.9% in 1967-68, the direct per capita expenditure on either primary or middle or secondary or higher education has not increased in the same proportion as the per capita income at current prices, which increased by 110.4% during the period 1951-52 to 1967-68. The teacher-pupil ratio, which is often used as an index of efficiency of an education system, had deteriorated at all the levels of education. The expenditure incurred on training a teacher had also gone down during the aforesaid time period. There was around 33.2% reduction in the per capita investments in training college teachers. On other hand, expenditure on primary education and secondary education went up by around 83% as can be seen in the table below. This implies that most of the increased expenditure probably went into quantitative expansions like building more schools around the country.

⁵ Devarajan et al (1994) also say that public expenditure often take time in affecting growth.

Table I: Percentage increase in per capita expenditure on education (1950-51 to 1967-68)

Primary Education	83.1
Middle Education	77.7
Secondary Education	83.2
Higher Education (General)	70.2
Higher Education (Professional)	5.1
Teacher Training (Schools)	49.2
Teacher Training (Colleges)	-33.2

Source:- S.C. Goel (1974)

Probably, a disaggregation of education expenditure (categorized as quantitative and qualitative expenditure) is required while doing this sort of analysis. Devarajan et. al (1994) analyse by disaggregating the spending on education. Their paper finds that aggregate public spending on education have statistically insignificant impact on growth. However, when they do a disaggregated analysis by breaking down education expenditure into its various components they find that spending on subsidiary services to education (for example, transportation, food, medical services to students) and investments in programs aimed at improving teaching and research methods affect per capita growth rate positively.⁶

Finally, we once again come back to the issue of the institutional features of an economy and discuss how this factor might have played its part in case of India as well. Before 1990, India was a closed economy with a lot of regulations. The education, especially technical education was largely subsidized in India. Pre-1990 Indian economy was also characterized by rigid labour laws and several restrictions on large enterprises which gave them monopoly rights in the output market. The condition

⁶ The other two components of public education spending in the Devarajan et al (1994) paper were as follows:-

i) administration, management, inspection, pre-primary, primary and secondary education and ii) tertiary education.

was such that there were ample opportunities for rent seeking in both the public and private sector. Moreover, because of the rigid labour laws it was not easy to fire employees, especially in the public sector. Hence there was a tendency among the companies to hire fewer employees on long term contracts. As a result the unemployment among graduates in India was quite high. Further, there was clear evidence of rent extraction. In the OECD countries the average wage in the public sector is about 50% higher than per capita GDP whereas in India it was four times as high. Apart from this, there are many other benefits attached to a public sector job, such as subsidised housing. Pissarides (2000) states that on an average, public enterprises in India pay twice the average wage of private enterprises, despite the fact that they employ on average a less qualified work force which leads to misallocation of resources. In 1994, of those who succeeded in the civil service examinations for a job in public administration, 38% were qualified engineers and 5.5% qualified doctors. These statistics provide support for the arguments made in Murphy et al. (1991) that whether a country's human capital stock will be productive or not depends on its institutional structure.

Berthélemy et al. (1999) also argue that the human capital employed in the administrative civil service does not lead to acceleration of growth. Hence if we remove that part of human capital from the total human capital stock then we should be able to get better estimates of cross-country growth regressions. Bosworth, Collins and Virmani (2007) state that India has failed to take advantage of her large stock of scientists, engineers and technicians largely because of the limited employment capacity and the structure of the labour market.

Some scholars say that public spending on education is a necessary but not sufficient condition for growth.⁷ It has to be complemented by other good macro-economic policies (such as removing distortions from the labour market) and trade policies. In the next section, we discuss how trade openness can increase the effectiveness of education expenditure by removing distortions from the

⁷ For example, see “*The Road Not Travelled: Education Reform in the Middle East and North Africa*”, World Bank, 2007.

market, creating an incentive structure and by encouraging the skilled workers to engage in growth-enhancing activities.

5. Role of Trade Openness in increasing effectiveness of education expenditure

“A particular mechanism that is identified as providing incentives for trained labour to engage in growth-enhancing activities is trade liberalization” (Pissarides, 2000).

Pissarides (2000) argues that a closed economy fails to take advantage of its human capital stock. He further says that a country can fully realise the advantages of its education investments after adopting policies such as trade liberalization.

Trade openness brings competition into the domestic market, encourages redistribution of skilled workers to trade related activities and reduces opportunities for rent seeking. The same point has been stressed in Murphy et. al (1991) as well. Engaging in international trade requires conforming to international standards and knowledge of foreign markets which only educated labour can possess. The increased competition from trade also compels domestic producers to invest in new technologies which expand the knowledge base of the economy. Trade encourages exchange of ideas and technologies which implies that the developing countries like India can have access to superior technologies.

Hence it can be the case for India that education expenditure affected growth significantly only after the economy opened up in 1991 and trade is one of the major channels through which these investments are influencing growth. For example, investments in education lead to human capital accumulation which, in turn, increases the productivity of the labour force. This encourages further exports and thus promotes economic growth (Chaudhry, Malik and Faridi, 2010). Empirical studies for different countries (such as Tseng, 2006 on China, 1978-1999) suggest that trade promotes human capital accumulation and vice-versa.

Maybe, the above discussion explains the results (no long run relation between education expenditure and growth) obtained by papers such as Ansari and Singh (1997) which use the pre-liberalization time period for their analysis. Conversely, Chandra (2010) finds that education expenditure in India affect growth positively because he covers the post-liberalization period in his analysis. Tamang (2011) also finds that there exists a long run relationship between the two which is exactly the opposite of what Ansari and Singh (1997) observes.

6. Conclusion

Theoretically speaking, education expenditure should speed up economic growth. Endogenous growth theories, such as Romer (1990) and Lucas (1988) consider human capital accumulation as a driver of growth. However, the empirical papers, examining the relationship, have produced mixed results. There are quite a few reasons behind such varied findings. For example, if the government increase the expenditure on education by increasing tax rates then the negative tax effects may offset the positive expenditure impact. Also, quantifying the impact of education spending can be quite challenging. The problem can be two-fold. Firstly, a country improving its education policy is likely to improve other economic policies as well. As a result, increased economic growth will be the result of the joint impact of all those policies. In that case, separating the impact of the education policy from that of the other policies can be quite difficult. Secondly, it can be very hard to quantify the social returns of the education investments, also known as spillover effects (as they spill over from the skilled workers to other members of the society).

Moreover, education spending is a necessary but not sufficient condition for growth. There are certain other factors also such as the country's institutional structure and labour market characteristics which determine whether investments in education sector will affect growth significantly or not. Thus, a government, while spending on education, should also attempt to improve other macro-economic and trade policies. Such policies will remove the labour market distortions and create incentives for the skilled workers to participate in growth enhancing activities rather than rent-seeking activities. Many scholars are of the opinion that policies such as trade liberalization play a vital role in increasing the

efficiency of education investments. The institutional structure, labour market characteristics and openness policies largely vary across countries. That is why the empirical literature has failed to find a robust relation between education expenditure and economic growth. In fact, many empirical studies do not take those factors into account, at all, while estimating the relation between the two.

There are clear evidence of rent-seeking activities in the Indian economy which must have off-set some of the benefits from its education investments. Additionally, a large fraction of those investments in India has gone into quantitative expansion rather than qualitative improvements. Such investments had no significant effects on growth. Moreover, the country adopted openness policies only after 1991. Hence, empirical studies need to take these issues into consideration while investigating for an empirical relation between education expenditure and growth for India. If the hypothesized positive relationship does not show up in post liberalization data, then the case for continued public expenditure on education in India looks weak, at least from the perspective of economics.

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